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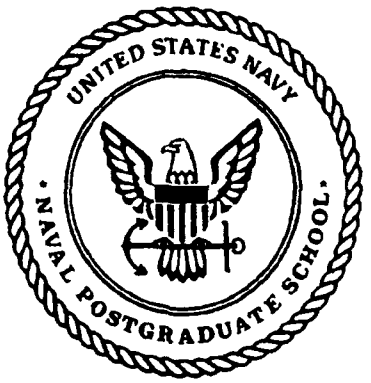

THESIS

AN EVALUATION OF THE NAVY'S RED/YELLOW/GREEN PROGRAM TEST

by

John Loup Gebhart

June, 1991

Thesis Advisor: Rodney F. Matsushima

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The Navy conducted a test of a new source selection tool known as the Red Yellow Green Program (RYG). The program was designed to assist field contracting activities obtain the best purchase value and reduce problems associated with poor contractor product quality. The RYG Program uses the information contained in the Contractor Evaluation System (CES) and the Product Deficiency Reporting and Evaluation Program (PDREP) data base to assess contractor product quality. This thesis evaluated the results of the one year test conducted at the five locations.

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An Evaluation of the Navy's Red/Yellow/Green Program Test

by

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ABSTRACT

The Navy conducted a test of a new source selection tool known as the Red/Yellow/Green Program (RYG). The program was designed to assist field contracting activities obtain the best purchase value and reduce problems associated with poor contractor product quality. The RYG Program uses the information contained in the Contractor Evaluation System (CES) and Product Deficiency Reporting and Evaluation Program (PDREP) data base to assess contractor quality This thesis evaluated the results of the one-year test conducted at five locations.

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I. INTRODUCTION

A. OBJECTIVES

The United States Navy has conducted a one-year test, which concluded on 1 November 1990, of the Red/Yellow/Green (RYG) Program. The RYG source selection improvement program uses contractor past quality performance as data in the source selection process. This program was developed to reduce the problems associated with poor contractor product quality. These poor contractor product quality problems not only impair fleet readiness, increase costs, and compromise safety but also inhibit the Government from obtaining the best purchase value from the contractor [Ref. 1].

The RYG Program is designed to use information contained in the Navy's Contractor Evaluation System (CES) and the Product Deficiency Reporting and Evaluation Program (PDREP) data base to assess contractor product quality.

This centralized data base was established at the direction of the Secretary of Navy to provide:

> A product deficiency reporting and data feedback system, maintenance of contractor/supplier quality history and effective use of these data to influence the pre-contract award process and formulate the basis for necessary post-award quality assurance action. [Ref. 2]

The CES/PDREP data base is composed of the following:

1. Contractor quality information gathered from Quality Deficiency Reports (QDRs)
2. Material Inspection Record (MIR)
3. Reports of Discrepancy (RODs)
4. Navy Vendor Data Analysis Report (VDAR)
5. Pre-award Surveys
6. Defense Logistics Agency (DLA) Contractor Improvement Program (CIP) Alert List
7. Method C, D, and E Corrective Action Listing
8. Defense Contractor Management Command (DCMC) Quality Systems Reviews
9. Product-Oriented Surveys
10. Small Business Administration (SBA) Certificates of Competency

These reports are forwarded to Navy Material Quality Assessment Office (NMQAO) via their respective Chain of Command. NMQAO then evaluates the reports to determine contractor liability and adds the appropriate entries to the CES/PDREP data base. Based on the information contained in the CES/PDREP data base RYG classifies each contractor as Red (high risk), Yellow (moderate risk) and Green (low risk) performers. Contractors who do not meet established criteria for RYG classifications are listed in the "Insufficient Data" category. Classification is done by Federal Supply

Classification (FSC) so a contractor who produces material in more than one FSC may have more than one RYG classification. [Ref. 2]

The RYG concept combines CES/PDREP contractor quality history with prescribed procedures to find the best value. RYG emphasizes contractor quality history by adding the cost of receiving poor quality goods or services into the procurement source selection process. One method of accomplishing this costing procedure is through the use of a Technical Evaluation Adjustment (TEA) which estimates the expected cost to the Government to correct or take appropriate action due to unsatisfactory contractor performance.

Another method used with the Fixed Price-Greatest Value method of procurement is to rate the offerors in terms of expected quality of performance. [Ref. 2] All proposals, including necessary TEAs, are evaluated to determine a source selection that will result in the best overall contract for the Government.

The focus of this research is to evaluate the effectiveness of the RYG Program during the initial test period. This research will include evaluation of actual contract award data during the test period, evaluation of the three purchase procedures classified under the RYG Program, evaluation of the cost avoidance/benefit and the actual

product quality received from contracts awarded under the RYG test. These data reflect test results conducted at five Navy field activities (Naval Air Engineering Center Lakehurst, Naval Avionics Center Indianapolis In, Naval Ships Parts Control Center Mechanicsburg Pa (Code 021, Level 1/SS), Naval Supply Center Charleston/Naval Shipyard Charleston, and Naval Supply Center Pensacola/Naval Aviation Depot Pensacola) which was compiled by NMQAO. [Ref. 3]

B. RESEARCH QUESTIONS

The primary research question is: During the initial test period, did the RYG Program provide for improved product quality and/or cost avoidance, as designed?

The research will evolve around the actual test data in determining the success of this program.

The secondary research questions in this area are:

(1) What are the procedures used for testing the categories (small purchase, large purchase, and Fixed Price/Greatest Value) in the RYG Program?

(2) Of the contracts awarded during the test period, what were the benefits of the RYG Program?

C. RESEARCH METHODOLOGY

Initial research was conducted by reviewing and analyzing data collected from primary sources, including actual raw

contract award data from each of the test sites. These data were collected through telephone interviews and monthly status reports of the RYG test to evaluate the current status of the test and the potential for future expansion of the program. Furthermore interviews were conducted involving personnel from the Office of the Assistant Secretary of the Navy (Research, Development, and Acquisition) Reliability, Maintainability, and Quality Assurance (ASN(RDA)RM&QA), Naval Material Quality Assessment Office (NMQAO), Naval Supply Systems Command (NAVSUP), Navy Ships Parts Control Center (SPCC), and the five activities involved in the test.

D. SCOPE AND LIMITATIONS

The scope of the thesis will be limited to the evaluation of the effectiveness of the RYG Program from information and data gathered during the one-year test period. The researcher will evaluate the data collected at the five test sites and the CES/PDREP data base maintained by NMQAO.

The research is limited to and focuses on the test period from 1 August 1989 to 1 November 1990. Although some test activities started later and are still providing data, the bulk of the actual test was conducted during the above mentioned period and, therefore, comprises the basis for this thesis.

E. ORGANIZATION OF THE STUDY

The remainder of the thesis is organized into the following chapters:

1. Chapter II, "Background," will provide an understanding of the RYG Program and how it interfaces with CES/PDREP.

2. Chapter III, "RYG Test Procedures under CES/PDREP," will discuss the RYG Program within the structure of small, major, and fixed price/greatest value.

3. Chapter IV, "CES/PDREP Program Analysis," will evaluate the RYG Program during its test period and provide a benefit analysis.

4. Chapter V, "Conclusions and Recommendations," will briefly describe the effect that the RYG Program has had on the Navy's material procurement quality.

F. SUMMARY OF FINDINGS

The findings include the evaluation of the benefits provided by a comprehensive evaluation of the RYG Program following the one-year test period to assist Navy procurement activities in the determination of the feasibility of further implementation of the RYG Program.

II. BACKGROUND

A. RED/YELLOW/GREEN PROGRAM

The Navy, like other Department of Defense components, continues to experience problems with contractor product quality. These problems impair fleet readiness, increase costs, and compromise safety. A key to improving quality is to use contractor product quality history in the contract award process to ensure the Navy receives the quality it requires. [Ref. 4]

The Navy developed the Red/Yellow/Green (RYG) Program to meet the requirements of the Department of Defense (DoD) and Secretary of the Navy (SECNAV) policies. These policies state that contractor quality history will be collected and maintained in a centralized data base to assure that contracts are not awarded to contractors with a previous history of providing unsatisfactory quality products without determining required quality assurance action prior to and after contract award.

Red/Yellow/Green Program is the title given to the methodology of evaluating and categorizing contractor quality performance data by Federal Supply Classification (FSC) and using these data to assist in the source selection process.

Under the RYG Program, a contractor's past quality performance is evaluated and assigned a color classification based upon the degree of risk to the Government of receiving poor quality products. The RYG Program does not classify contractors, but rather it classifies the contractor's quality performance by FSC, so a contractor who provides material in more than one FSC may have more than one RYG classification.

The RYG Program color classifications are: RED - High quality risk, YELLOW - Moderate risk, and GREEN - Low risk. Contractors for which there is insufficient data are assigned an "Insufficient Data" status. The general description of each color classification as outlined in the program are:

1. **RED**: The performance history of the contractor for a given commodity indicates that he has supplied goods or services of poor enough quality to require the application of special quality assurance actions. The seriousness of the contractor's negative quality history is sufficient to require review and approval by the head of the contracting office (as defined by the Federal Acquisition Regulation (FAR)) prior to contract award. The contractor is designated as a high quality risk.

The red classification will not be utilized to bar a contractor from competing. The intent is to deter awards from continually poor performers and ensure that sufficient

oversight is in place in the event that a red contractor receives an award. [Ref. 5]

2. **YELLOW**: The performance history indicates the contractor has supplied goods or services of a particular commodity of poor enough quality to require special quality assurance actions in an effort to reduce the risk of delivery of poor quality products to the Navy. The contractor is designated as a moderate quality risk. [Ref. 5]

3. **GREEN**: The performance history indicates that the contractor has supplied goods or services which meet or exceed the quality requirements of the contract. His proposal is to be evaluated in accordance with established acquisition regulations without anticipating special quality actions. The contractor is designated as a low quality risk. [Ref. 5]

The specific criteria used to classify a contractor as Red, Yellow, or Green are listed in Appendix A.

4. **INSUFFICIENT DATA**: A contractor is identified as having "Insufficient Data" to meet the RYG classification on a particular commodity if: (a) The contractor is a first time offeror for that FSC, (b) no quality history is available on the contractor for that FSC, (c) the only available quality information data is beyond the evaluation periods set forth in APPENDIX A. In the case of a contractor being classified as having "Insufficient Data", the Contracting Officer may elect

to employ additional quality assurance actions. Technical Evaluation Adjustments (TEAs) will not be added to the contractor's price during the pre-award evaluation process. [Ref. 5]

It is important to understand that procedures set for the RYG Program are not designed to eliminate the requirement that a determination of responsibility be made for every prospective contractor prior to award. The color classification of a contractor alone is insufficient to determine responsibility of the contractor. Responsibility determination must be made in accordance with Federal Acquisition Regulation 9.104 without consideration of the contractor's color classification.

The solicitation documents and *synopsis* in the Commerce Business Daily for procurement that will be made under the RYG Program during the test period are required to advise contractors of RYG procedures and will indicate that final contract award will be based upon a combination of factors, including price and historical quality performance.

B. CONTRACTOR EVALUATION SYSTEM/PRODUCT DEFICIENCY REPORTING AND EVALUATION PROGRAM

The RYG Program uses information contained in the Navy's Contractor Evaluation System (CES) and the Product Deficiency

Reporting and Evaluation Program (PDREP) data base. The CES/PDREP are managed by the Naval Sea Systems Command detachment, Naval Material Quality Assessment Office (NMQAO), under the direction of the Office of the Assistant Secretary of the Navy (Research, Development, and Acquisition) Reliability, Maintainability, and Quality Assurance (ASN(RDA)RM&QA).

The data base is composed of contractor quality information gathered from the following sources:

1. Quality Deficiency Reports (QDRs). QDRs are prepared by Navy field activities to document product quality deficiencies, design deficiencies, or inadequate procurement documents resulting in defective new and newly reworked material being delivered to the Navy. [Ref. 5] All QDRs are submitted to the Naval Air Systems Command (NAVAIR), the Navy focal point for QDRs. Once each week, QDRs determined to be contractor liable and with defects verified, are transmitted by NAVAIR to NMQAO for inclusion in the PDREP data base. [Ref. 6]

2. Material Inspection Record (MIR). MIRs are prepared either by Navy representatives performing technical inspections at a contractor's plant or by Navy field activities performing technical inspections upon receipt of material. MIRs are submitted to the Navy Systems Command having cognizance over the field activity. [Ref. 3] The Systems Commands (NAVAIR, NAVSUP, Naval Facilities Engineering Command, and Space and Naval Warfare Command) then transmit the MIRs to NMQAO. The MIRs generated by NAVSEA activities are submitted directly to NMQAO. [Ref. 6]

3. Reports of Discrepancy (RODs). RODs are prepared by Navy field activities to document receipt of incorrect material, shortages and overages, and discrepancies in preservation, packing, and marking. RODs are submitted to Naval Supply Systems Command

(NAVSUP). [Ref. 5] However due to lack of real value of the RODs to the RYG program, RODs are no longer being included in the classification process; however, they will continue to be collected for the CES/PDREP program. [Ref. 7]

4. Defense Logistics Agency (DLA) Contractor Improvement Program (CIP) Alert List. Contractors are placed on the DLA alert list if DLA has placed them in the CIP, if they have received a negative pre-award survey, or if Defense Contract Management Command (DCMC) has recommended they be given a pre-award survey for a particular reason. [Ref. 8] DLA sends a hard copy of the list to ASN(RDA) RM&QA. ASN then sends a copy to NMQAO. [Ref. 6]

5. Navy Vendor Data Analysis Report (VDAR). The VDAR identifies contractors who, because of past poor performance, should be considered carefully before being awarded a contract and should be monitored after contract award. Evaluation of performance is based on data from pre-award surveys; QDRs; open DLA method C, D, or E corrective action; and conviction or an investigation for malpractice or fraud. [Ref. 8] The VDAR is compiled by NMQAO based on past performance and input from Navy Systems Commands and their field activities. [Ref. 6]

6. Pre-award Surveys. Pre-award surveys are conducted by contract administration offices when a procuring contracting officer needs additional information to determine contractor's management, financial capability, and technical skill to determine whether he/she will be able to perform the proposed contract. [Ref. 9] Only those pre-award surveys requested by Navy activities are included in PDREP. The Navy activities that requested the survey submit a copy of the completed pre-award survey to the cognizant Systems Command. The Systems Commands then transmit copies to NMQAO. NAVSEA activities submit copies of surveys directly to NMQAO. [Ref. 6]

7. Method C, D, and E Corrective Action Listing. Contractors are placed on the corrective action listing if DLA has documented deficiencies in their quality programs. Specifically, method C indicates that the contractor has a serious quality problem or has not corrected a deficiency documented using method

B (a major deficiency). The Government sends a letter to the firm's top management requesting corrective action. Method D indicates that less severe methods of corrective action (i.e., A, B, and C) have failed. The acquisition quality assurance program is discontinued, and the contractor is advised that the Government will not accept his goods or services until deficiencies have been corrected. Method E is used to advise a prime contractor that a subcontractor has quality deficiencies that would justify method C or D corrective action in a prime contractor and to request that the prime take corrective action with his subcontractor. [Ref. 10] DCMC sends a hard copy of the listing to ASN(RDA) RM&QA. ASN then sends a copy to NMQAO. [Ref. 6]

8. Product-Oriented Surveys. Product-Oriented surveys are technical product inspections conducted in a contractor's plant when a buying activity desires to perform a special test on an item. They are performed by DCMC when requested by the buying activity. If DCMC does not have the necessary resources, the buying activity may perform the survey. When a Navy activity requests a product-oriented survey, it submits a copy to the appropriate System Command. The Systems Commands then transmit the surveys to NMQAO. NAVSEA activities submit copies of surveys directly to NMQAO. [Ref. 6]

9. Defense Contract Management Command (DCMC) Quality System Reviews. Quality system reviews are performed by DCMC. They involve an evaluation of the contractor's quality procedures and verification that the contractor's quality practices conform to those procedures. [Ref. 10] The reviews also evaluate the Government's in-plant quality assurance program. Navy activities receive copies of quality system reviews if they participate in the review with DCMC or if they request a copy. Copies received by Navy activities are submitted to the appropriate Systems Command. The Systems Commands then transmit the reviews to NMQAO. NAVSEA activities submit copies directly to NMQAO. [Ref. 6]

10. Small Business Administration Certificates of Competency (COC). If a small business is determined to be non-responsible by a Government buying activity, the small business can request that the Small Business

Administration (SBA) determine whether the business is responsible. If the SBA concludes that the small business is responsible, it will prepare a COC to document that determination. The buying activity must then treat the small business as a responsible offeror. [Ref. 3] The SBA sends hard copies of COCs to NMQAO for inclusion in PDREP. COCs are collected mainly for CES/PDREP and are not included in the RYG classification process. However, they do provide the contracting officer with a more complete profile of the contractor. [Ref. 11]

The CES data base excludes:

1. Material evaluations for base application and local use.

2. Contractors developing major weapon systems.

3. Medical procurement, material, and suppliers.

4. Subsistence procurement, material, and suppliers.

5. Unsatisfactory material condition caused by improper handling after receipt, deterioration during local storage, or inadequate maintenance or operation.

6. Transportation discrepancies caused by the carrier.

7. Ammunition and explosives accidents.

8. Nuclear weapons procurement, material, suppliers, or evaluations.

9. Naval Nuclear Power Plant primary system procurement, material, suppliers, or evaluations.

10. Strategic Systems Project Office procurement, suppliers, or material evaluations. [Ref. 3]

NMQAO utilizes the data base to classify the contractors according to the RYG Program criteria and updates the RYG status report monthly.

The CES/PDREP identifies contractors whose quality history may require the use of additional pre-award or post-award quality assurance actions to ensure products of the required quality are received. However, under CES/PDREP there is no procedure to determine which offeror provides the best value to the Navy. Consequently, what makes the RYG concept unique is that it combines CES/PDREP contractor quality history with prescribed procedures to find the best value. RYG emphasizes contractor quality history by adding the cost of receiving poor quality goods or services into the procurement source selection process. RYG adds this cost to the offeror's price, permitting the Contracting Officer to select a contractor on the basis of quality and cost, rather than cost alone.

C. VALIDITY OF CES/PDREP DATA BASE

A major concern of the RYG Program is the validity of the CES/PDREP data base and the effect that this possible lack of validity might have on contractor protests emerging from the RYG Program. To ensure that contractors have every opportunity to challenge specific classifications, NMQAO mails letters on a monthly basis to Red and Yellow classified contractors detailing the reasons for their classification, the effect of the classification, and the procedures required to challenge the classification. During the test period, a

total of 5,983 letters were mailed. Surprisingly, only 461 responses were received, and of those only 109 were disagreements with the classification. Those challenges resulted in 53 corrections to the data base and 43 classification changes. With less than 2% of all Red and Yellow classified contractors responding to the classification letter with challenges, and less than 1% of all contractors notified resulted in changes to the data base, the credibility of the data base has been firmly established. Furthermore, by sending notification letters to the contractors to inform them of their color classification and procedures for redress, NMQAO has virtually eliminated the possibility that protests based on the accuracy of the data base will be filed. Any contractor who fails to take timely action to correct the data base will be prevented under the rules of estoppel from utilizing the error in the data base as a basis for protest at a later date. CES/PDREP is updated monthly to include all corrective actions resulting from challenges and new information processed from all field activities. The Contracting Officer can then access the data base and from the classification and code assigned to the contractor, determine whether a Technical Evaluation Adjustment (TEA) should be added to the contractor's proposal.

D. TECHNICAL EVALUATION ADJUSTMENT (TEA)

Technical Evaluation Adjustment's (TEA) are the anticipated additional costs the Government would incur for taking certain additional pre-award and post-award quality assurance actions when the contractor for that product is classified as "Red" or "Yellow". TEA's are applied based on whether the award is considered a small purchase (< $25,000) or a major purchase (> $25,000). The procedures for applying the TEAs are as follows:

1. For the purposes of the RYG program, simplified small purchase procedures were initially defined as purchases with a total value in excess of $2,500 but less than $25,000. When RYG procedures are used for simplified small purchases, the purchasing agent determines the offeror's color classification from the data base and assigns the applicable standard TEA value as listed in APPENDIX C. The standard value is derived from the cost of additional quality assurance actions such as Government Source Inspection, Receipt Inspection, and Quality Assurance Letter of Instruction. The cost estimates of these quality assurance actions which are required to be performed are listed in APPENDIX D. The corresponding value assigned to each of the quality assurance action are calculated as shown in APPENDIX E.

2. For major purchases, RYG procedures require that the Contracting Officer determine the offeror's color classification and code from the RYG Evaluation Criteria listed in APPENDIX A. Utilizing the guidelines for TEA assignment in APPENDIX B, the Contracting Officer can determine which additional quality assurance requirements the Government will use. The additional requirements correspond to estimated costs listed in APPENDIX D. These costs have been computed from the standard costs listed in APPENDIX E. The total cost of the additional quality assurance requirements will give the Contracting Officer the required TEA.

Except for actual DCMC costs, the estimated costs listed in APPENDIX D are provided as examples. Each activity must calculate its own set of TEA costs using the format in APPENDIX E, since the TEA costs are based on local prevailing test costs and labor rates.

The TEA represents the anticipated cost to the Government to correct or take appropriate quality assurance action due to poor previous contractor performance. The application of the TEA raises a contractor's proposed price. This provides the Contracting Officer with the ability in the source selection process to obtain the supplies or services at the best overall value to the Government.

After TEA's have been computed and added to the contractor's proposals, the contract is then awarded to the appropriate contractor. If the contract is subsequently awarded to a Green offeror, no other action is required. If, however, the contract is to be awarded to a Red or Yellow offeror, the Contracting Officer must insure that the appropriate clauses are added to the contract to ensure that additional quality assurance actions are taken during performance.

E. GREATEST VALUE / BEST BUY

Another manner in which RYG is utilized is through GREATEST VALUE/BEST BUY evaluation criteria, which applies only to negotiated competitive solicitations. During the test period, the test activities developed evaluation plans and procedures tailored to their requirements. The evaluation plan considers price, which is given a minimum evaluation weight of 40%, and the remaining percentage apportioned only to quality. Point scores are then assigned according to the contractor's RYG classification, and the offerors are then ranked according to those point scores for both factors (price and quality).

F. SUMMARY

This chapter described the background surrounding the Navy's RYG Program. It introduced and briefly described the RYG Program evaluation criteria, the CES/PDREP data base which is the basis of the RYG Program, and the TEA and Greatest Value process of assigning adjustments to Red or Yellow contractors. The next chapter will detail the three test procedures developed to implement the RYG Program.

III. RYG TEST PROCEDURES UNDER CES/PDREP

A. INTRODUCTION

The RYG Program seeks to expand the CES concept by assigning color classifications to selected Federal Supply Codes (FSCs), by contractors. This effort is an attempt to denote the recurring problems with a particular FSC on previous Department of the Navy (DON) contracts. Under the test, procedures of the RYG program were divided into three categories, simplified small purchases, major purchases, and fixed price-greatest value procedures.

B. EVALUATION OF SMALL PURCHASE PROCEDURES

The simplified small purchase procedures were tested at all five test sites during the 12-month test period. The procedure was applied to all oral and written quotations solicited during this test period that resulted in the purchase orders for selected FSCs with an estimated value in excess of $2,500.00. [Ref. 12] However, following low initial responses, this dollar threshold was lowered to zero for all purchase orders. [Ref. 7]

Each activity was allowed to determine whether to use the simplified small purchase procedures on blanket purchase

agreements (BPA), imprest fund purchases, and delivery orders against established contracts or General Services Administration (GSA) contracts. [Ref. 6] These type of procurements used in conjunction with the RYG program required the activity to submit a written purchase order to document the purchase. However, the Director of Contracting at each of these sites except for SPCC could grant a waiver concerning the use of these procedures. At SPCC, the Director of Hull, Mechanical, and Electrical (HM&E) Contracting Department must grant all waivers. [Ref. 1]

The RYG small purchase procedures require that purchases awarded be based on the current consideration of the contractor's FSC color classification at the time of source selection. In view of this color classification requirement at the time of the award, some reclassification of FSCs were required to facilitate proper classification of contractors. The periodic change of the RYG data base concerning contractor classifications resulted in the need to consult the data base for each and every procurement at the time of source selection. This consulting of the data base was, however, a very time consuming practice. It required that each test activity add new steps to their normal acquisition procedure so to enable the contracting personnel a means to the proper classification of the contractors. Additionally, the data

base was only updated on a monthly basis, causing the activities even more apprehension about the accuracy of the data base. [Ref. 7]

Each test site was allowed to select its own set of FSCs, geared toward its mission and purchasing authority. The test sites could modify the set of FSCs during the test period to accommodate the changes in requirements. All the needed modification of these FSCs was approved by the Director of Contracting at each site. The overall effect of this practice resulted in the sites providing a very large and concentrated data base within each of their areas of selection. This concentration of data base collection enabled the RYG program to be utilized quickly on even insufficient data contractors.

When the required synopsis in the Commerce Business Daily (CBD) was provided for the solicitations of procurement of material or services, the synopsis explained that, while price would be a significant factor in the evaluation of offerors, other factors, including contractor's quality history, would be considered in the final decision.

The solicitation requirements, if in written form, will also included a clause advising the contractor of the RYG procedures as provided in APPENDIX F. Oral requests for quotation required the information in the clause to be orally conveyed to the contractor. [Ref. 12] Although this practice

resulted in some additional time allocation by the Government buyers, the process was highly successful. No protests or complaints were received from contractors due to this requirement or the lack of its use. [Ref. 7]

The process for evaluating each offeror's RYG color classification (Red, Yellow, Green, or Insufficient data) is determined from the data base. Once the classification is made, the offeror's proposal is adjusted by applying the proper Technical Evaluation Adjustment (TEA). A Green offeror's proposal is evaluated as received since past performance indicates that quality is not a concern in his case. A Yellow offeror's proposal requires that the standard simplified small purchase TEA of $1,255.00 be applied to the quote. This adjustment is made to align this offeror's proposal with other offerors in view of the poor past quality history exhibited by this offeror. A Red offeror's proposal requires that a TEA of $2,499.00 be applied to the quote to compensate the Government for the costs of additional quality requirements necessary. In the case of a contractor with Insufficient data to be classified, no TEA is added to his cost proposal. [Ref. 1]

Once the TEAs are assigned to the Red and Yellow contractor's proposals, source selection begins. If the contract is awarded to other than a Green contractor, the

additional requirements detailed in APPENDIX C must be performed by the Government. More importantly, if a Red contractor is awarded the contract, the head of the contracting office must approve the award. This additional work would suggest that the purchasing activities are spending considerably more time in awarding contracts under the RYG Program. However, the initial time invested in the RYG Program process has proven to save time and effort of not only contracting personnel but also production personnel using this material. SPCC is only able to gauge its success by the resulting number of Quality Deficiencies Reports (QDR) being processed by the fleet. To date, SPCC has shown a marginal improvement in material acceptance by the fleet. [Ref. 7]

C. EVALUATION OF MAJOR PURCHASE PROCEDURES WITH TEAs

The RYG Program limited the major purchase procedure with TEAs to only two sites: SPCC Mechanicsburg, PA, and NSC Pensacola/NADEP Pensacola. The procedures cover all negotiated competitive solicitations for each site's selected commodities when other than the simplified, small purchase procedures (a value greater than $2,500.00) are utilized during the test period. [Ref. 13] Each site has selected a set of FSCs of special interest toward its mission and purchasing authority. And again as with simplified small

purchase procedures, a waiver of these procedures was obtained from either the Chief of the Contracting Office except for SPCC, which requires authority from the Director of the Hull, Mechanical, and Electrical Contracting Department. [Ref. 1]

The synopsis in the Commerce Business Daily (CBD) indicates that while price is a significant factor, the final contract award will be based on other factors such as past quality performance and other factors detailed in the solicitation. [Ref. 1] Additionally the solicitation bears a notice to the contractors stating the following:

> This procurement is part of a test of the Navy's Contractor Evaluation System, "Red/Yellow/Green" Program. Award will be based upon the Contracting Officers decision as to which offer provides the best value to the Navy--price, past quality performance, and other factors considered. Details are provided in the provisions entitled "NOTICE TO PROSPECTIVE OFFERORS (Section L) and "ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (MAJOR PURCHASE PROCEDURES)" (Section M). [Ref. 1]

APPENDIX G entitled "NOTICE TO PROSPECTIVE OFFERORS" and "ADDITIONAL EVALUATION FACTORS-- TEST OF CONTRACTOR EVALUATION SYSTEM" contains the provision of both sections L and M respectively of a solicitation.

The initial process of the Major purchase procedure is similar to that of the simplified small purchase procedure in that the Contracting Officer queries the RYG data base to determine the color classification of the offeror. A classification of Green indicating a high quality offeror will

result in no TEA assignment to the offeror's proposal. A Yellow or Red contractor classification will require additional work by the Contracting Officer. In both cases the contractor's quality history will be reviewed to determine the appropriate amount of TEA to administer to the solicitation. The amount will be determined based on the quality assurance action required based on that contractor's history. This amount will be greater for the Red contractor since a greater amount of quality assurance action will be required due to this color classification. [Ref. 2]

At this point in the procedure is where the difference between simplified small purchase procedures and major purchase procedures become apparent. In simplified small purchase procedures, a standardized amount ($1,255.00 and 2,499.00) is adjusted to the solicitation of Yellow and Red offerors. Under major purchase procedures the TEAs are based on specific quality deficiencies in the contractor's performance history. Therefore, the Contracting Officer must first evaluate the reason for the contractor's classification from the RYG data base. Next, the Contracting Officer must decide the quality assurance actions that the Government will require based on a guideline provided in APPENDIXES A and B. [Ref. 13] By decoding these two guidelines (APPENDIXES A and B) the Contracting Officer can determine the appropriate TEAs

to apply to each solicitation. These guidelines, however, are only cost estimates which are provided as examples. Based on its own labor rates and test costs, each site must calculate its own TEAs to reflect the respective area's estimated costs. Initially this process is extremely time consuming. In view of this burden, NMQAO has created a model for each site based on cost data provided by each site to alleviate this need to calculate TEAs for major purchases each time. This program allows the site's Contracting Officer to select from a computer screen the proper quality assurance action required for that contractor. [Ref. 7]

Overall, the Major Purchase Procedures are not difficult or time consuming given the excellent assistance provided by NMQAO. The Contracting Officer's at both test sites were satisfied with the program and its results.

D. EVALUATION OF MAJOR PURCHASE WITH FIXED PRICE/GREATEST VALUE

The test of RYG utilizing the "Fixed Price/Greatest Value" method for major purchases was limited to only three sites: Naval Air Engineering Center, Lakehurst NJ., Naval Avionics Center, Indianapolis, IN., and Naval Supply Center/ Naval Shipyard, Charleston SC. As with major purchases with TEAs, the "Fixed Price/Greatest Value" procedure covers all

negotiated, competitive solicitations for the selected commodities of interest of each site when other than simplified small purchase procedures are used. When sealed bids were appropriate this procedure was also be used. Solicitations under this procedure include a clause, as provided in APPENDIX H, notifying the contractors of this test program. Again, each site was granted the discretion of selecting the FSCs of interest to that site, and selecting the source selection/evaluation procedure most advantageous to the requirement. [Ref. 14]

The sites had waiver authority through their respective Chief of the Contracting Office. The only real constraint for the purpose of the test was the requirement that price would constitute at a minimum 40% of the evaluated weight, with the remainder apportioned according to the quality assurance actions required by the RYG program. The source selection criteria did not consider any other factors (price and RYG quality classifications) during the test period. [Ref. 14]

Upon receipt of a proposal, the Contracting Office reviews and analyzes the contractor's commodity performance as set in the CES/PDREP data base to determine the color classification. With this information, the staff determines each contractor's applicable rating/ranking assignment (exemplified in APPENDIX I) in accordance with the source selection plan criteria. If

commodities of different offerors are within the same color category, the Contracting Office provided a narrative detailing the relative differences between the contractors' proposals. [Ref. 14]

If the contract is awarded to a Yellow or Red contractor, the Contracting Office determines the additional quality assurance actions required to be imposed on the contractor. The Contracting Officer then includes these actions in the contract. [Ref. 6]

The overall effects of this process did not increase the administrative processing time of the operation in any of the three sites. In fact the overwhelming conclusion of the three sites was that in the long run, given the potential problems of poor material receipt, the program proved to be a major success. [Ref. 7]

E. SUMMARY

This chapter briefly described the three procedures utilized in the RYG Program. It detailed the process being followed within the three procedures and introduced the usage of the CES data base. The following chapter will evaluate the cost avoidance, contract awards and benefits of the RYG Program.

IV. CES/PDREP PROGRAM ANALYSIS

A. INTRODUCTION

This chapter evaluates the CES/PDREP program, discusses the maintenance and accuracy of the CES/PDREP data base, and evaluates the method of computing TEAs. Additionally, it evaluates the cost avoidance savings and product quality potential of the system and the cost avoidance savings realized during the RYG Program test. Finally, the RYG Program benefits and contract awards are assessed.

The chapter's discussion is based on the cost saving potential of the RYG Program. The RYG Program test data provides the basis for the cost avoidance evaluation.

B. EVALUATION OF DATA COLLECTION/DATA BASE

The Navy's Red/Yellow/Green (RYG) Program uses contractors' product quality evaluation history to aid Contracting Officers and quality assurance personnel in determining source selection. The contractor's product quality evaluation history aids the Contracting Officer in assessing the risk associated with awarding a contract to the contractor. The risk, based on this quality history data base, is the data which the RYG Program uses to determine the

color classification for each Federal Supply Class (FSC) of every contractor listed. These data, which the Contracting Officer uses, remain on file for several years before being moved to an archive file. Archiving occurs for two reasons: first, to reduce these data on each active file to one year; and secondly, to remove files which have been inactive for more than one year.

The RYG Program is able to support the source selection process in two ways: Technical Evaluation Adjustments (TEAs) and Greatest Value/Best Buy. In each of the two source selection processes, the contractor's quality performance history is emphasized to properly assess the offerors. The past contractor quality performance history is drawn from the centralized data base called Contractor Evaluation System (CES)/ Product Deficiency Reporting and Evaluation Program (PDREP). The collection organization, Naval Material Quality Assessment Office (NMQAO), in Portsmouth, New Hampshire manages these data base for the Navy. NMQAO then produces a monthly report that classifies contractors based on the data contained in the data base and sends these results to the RYG test sites. NMQAO also sends a copy of these results with an explanation of the RYG program to each newly assigned Red and Yellow contractor. Within this letter, NMQAO requests that

any questions or concerns related to these classifications be forwarded to their office. [Ref. 3]

1. Product Deficiency Reporting and Evaluation Program (PDREP)

PDREP is a system of confirmed information. The system is an on-line information system which brings several aspects of procurement and contracting together for a Contracting Officer. The PDREP system is designed to save tax dollars, improve material quality, and encourage positive workmanship in contractors.

PDREP was initiated from the Navy's and the Government's need for an effective and meaningful method of stopping receipt of poor quality material. It was this need to coordinate within a single data base the pertinent facts of a contractor's past quality history and to assist contracting personnel in making informed source selections, that a centralized computer data base was developed. The system eliminates duplication of product deficiency information systems and improves the Navy's procurement activities by providing consistency in accumulated findings. The system is available not only to the test site activities but also to all Systems Commands, Procuring Contracting Officers, and all Quality Assurance personnel desiring this type of information. The system is primarily constructed from the Quality

Deficiency Reports (QDRs) and Report of Discrepancies (RODs) prepared and forwarded to the NMQAO office from all naval activities.

The PDREP program, under the provisions of the DoD Quality Program, has developed a standard system for collecting and using seven standard types of contractor quality history data in the acquisition and procurement process. The seven standard types are:

a. Acquisition history

b. Contractor plant visits

c. Product deficiency reports (QDR and ROD)

d. Waiver/deviation requests

e. First article/production lot tests

f. Special quality data

g. Technical receipts inspection results

The core of the system is a centralized automated data base which provides a better picture of a contractor's past quality performance by combining these reports from different activities. A part of PDREP is the Contractor Evaluation System (CES) which is the actual data base from which RYG extracts its information regarding contractor performance.

2. Contractor Evaluation System (CES)

The CES's RYG concept is truly an evolutionary process which addresses costs associated with doing business with

other than quality contractors. The system combines an automated information system with the off-line manual processing by contracting personnel. Other attempts at providing incentives to contractors through emphasis on quality, such as the "Blue Ribbon Program" of the Air Force, while successful in some ways, have been limited in that they apply only to certain products and require contractors to volunteer for the program. The RYG Program uses a data base that consists of information derived from the award and the administration of literally hundreds of thousands of DoD contracts.

The CES data base, as a basis for evaluating contractors under the RYG Program, has proven to be extremely sound during its test period. While it is understood that no system can be implemented without some unresolved problems or concerns, the RYG Program has, through the use of the CES data base, proven to the acquisition community that quality history data can be collected and processed into a usable format. This enables Contracting Officers to make better informed source selection decisions and insure that the Government receives the quality it deserves.

3. NMQAO Data Base Issues

The maintenance and accuracy of the NMQAO data base is superb. The key measure of the accuracy of the data base is

the response from contractors who are classified as Red or Yellow. As discussed in Chapter II, following the monthly update of the CES data base, NMQAO mails letters of notification to all contractors who are classified as Red or Yellow. During the test period, 5,983 of these letters were sent with only 109 companies disagreeing with their classification. [Ref. 4] Of these challenges, only 53 corrections to the data base were required, giving the data base a better than 99% acceptance rate. This high acceptance rate is attributable to the quality control process that all input data are subjected to.

a. Quality of the Data Base

The major potential problem with the data base is its raw data input quality and accuracy because it depends on the individual RODs, QDRs, and other similar documents prepared by numerous Government activities. This administrative process, which can result in errors, remains the single most important concern of all Contracting Officers. The following is an example of this kind of error.

In this case, a telephonic authorization from a Contracting Officer at Charleston Naval Supply Center granted a contractor permission to substitute material in filling a purchase order for the Charleston Naval Shipyard. When the shipyard received the material, and discovered that the

material was a substitute, a quality deficiency report was generated. This subsequently became an element in the CES data base which erroneously classified the contractor as other than Green. However, due to the NMQAO letter of notification, this error was quickly rectified. The consequence of this potential improper classification could have caused this contractor to be displaced on future contracts. This kind of daily administrative contract amendment could seriously impact the quality of the data base.

In view of this potential problem, Contracting Officers anticipated that this type of error could result in the questioning of the equity and fairness of the RYG Program. This potential breach of the CES data base could formulate the basis for case law which could challenge the integrity of the RYG Program.

To minimize problems such as the one related above, the raw data from field activities must pass through a two-step review process prior to being input into the CES data base. First, the field activities are required to submit CES input of all types through their cognizant hardware system command for initial review, and in the case of QDR's and ROD's, a determination of the contractor's liability. Second, the input data are further reviewed by NAVAIR or NMQAO prior to input into the CES data base. The safety valve for the

system is the contractor notification letters discussed previously. These letters afford the contractor the opportunity to submit for consideration and possible classification correction reclamas of all input data which the contractor feels are erroneous. By notifying contractors of their classification, the reasons for that classification, and providing an avenue to correct any errors in the data base, the contractors would be estopped from challenging the data base's accuracy at a later date without first responding to the letter of notification.

b. Method of Computing TEA Cost

Another concern of many Contracting Officers was the method of computing the dollar value of TEAs that will be applied to an offeror's proposal. This concern is driven by the fact that not all TEA values reflect the actual costs that will be incurred by the contracting office for the additional quality assurance actions. Given that not all TEAs are based upon actual costs or upon local historical data, the RYG Program may be in violation of the laws and regulations concerned with integrity of the procurement process.

The RYG Program utilizes fixed TEAs for simplified small purchases and pre-determined TEA values for major purchases, which are listed in APPENDIX C and D. These TEA values are derived from the calculations listed in APPENDIX E.

Given this situation, the resolution to this RYG Program problem is relatively simple. Contracting offices who participate in the RYG Program should develop their own TEAs based on the local prevailing labor rates and hours expended for each quality assurance action developed from their historical data. The calculations contained in APPENDIX E can be utilized as a guide to assist in the development of these local TEAs. The Contracting Officer is then at liberty to update the local TEAs as often as necessary to remain current with local market conditions.

4. Summary

The methods of data collection, review, and input for the PDREP/CES data base has proven to be very effective in controlling the accuracy of the data base. By providing the contractors with a viable notification system and procedures to address errors, perceived or actual, NMQAO has developed a sound basis for the RYG Program. Furthermore, by utilizing this data base, coupled with locally generated TEAs, a Contracting Officer is assured of a solid basis for any displacements which may occur during the source selection process.

C. EVALUATION OF RYG COST AVOIDANCE/PRODUCT QUALITY

1. Evaluation of Potential Overall System Cost Avoidance

Cost avoidance and product quality are the foundations of the RYG Program. These two related areas provide the measurement of success that the RYG Program is judged upon. The improvement of the overall product quality to the fleet is the bottom-line objective of the RYG Program. The chain reaction associated with the improvement of product quality leads not only to fewer defects in products but also to the subsequent reduction in cost by avoiding use of these defective products. The cost avoidance, which in turn is also gained by these improvements in product quality, can be measured in the following terms:

1. Reduced corrective quality assurance action costs
2. Rework costs
3. Ripout costs
4. Replacement costs
5. "Down time costs"(most important to fleet personnel)

The elimination of these types of costs also greatly reduces the risk of potential safety infractions caused by poor quality products.

2. Evaluation of the Product Quality

Product quality can not at this time be directly evaluated solely using the RYG Program. Cost avoidance,

however, can be evaluated using the RYG Program test results. By extrapolating the interrelationship between product quality and cost avoidance, the product quality evaluation as well as cost avoidance can be assessed.

Based on the Navy's RYG Program test period, it is estimated that over $440 million dollars a year could be saved by putting the program into full operation at the Navy's Inventory Control Points (ICPs) (ASO and SPCC), Regional Contracting Centers (NRCCs), Naval Supply Centers (NSCs), Laboratories, and at several other large buying activities. A detailed summary of the figures used to calculate this enormous saving is provided in APPENDIX J.

The potential cost avoidance savings due to the reduced incidence of repair and/or replacement of the material initially purchased would result in a $423 million dollar savings. The cost avoidance savings resulting from not having to prepare and process all the QDRs and/or RODs by fleet activities is estimated at $7.16 million. Finally, the reduction of the additional quality assurance actions required to be performed by these same fleet activities amounts to an estimated cost avoidance of $16.4 million. The sum of these potential cost avoidance savings quickly exceeds the $440 million dollar mark and is summarized below:

Repair/replacement cost avoidance	$422,561,545.
PQDR cost	7,159,200.
Additional QA actions cost avoidance ...	16,346,840.
SubTotal	446,067,585.
(less cost of additional QA actions)..	6,036,594.
Total	$440,030,991.

The calculations above are based on the following assumptions:

1. The assumption that the test activities are supplying contractor quality history to the PDREP/CES data base.

Based on discussions during the final RYG Program test period meeting, it was verified that all the activities who participated in the test program forwarded all pertinent contractor quality history data to NMQAO during the test period. Using this submission rate as a bench mark for the expected outcome when other field activities become a participant in the RYG Program, it is this researcher's opinion that this assumption is sound. The RYG Program appears to motivate agency personnel. These personnel in turn strive to ensure that the PDREP/CES data base is up-to-date.

2. The assumption that ten percent of an activity's procurement actions would have been subject to RYG.

As depicted in APPENDIX J, the 10% figure is not a scientific percentage but merely an estimate of the operational RYG Program actions anticipated when the listed

activities became RYG Program participants. This researcher believes this estimate is fairly reasonable based on the analysis provided in this section. However, there is little statistical data available from the test sites concerning the awards made within the test to make accurate predictions of the number of contracts or the dollar value that will actually apply to the RYG Program if it is fully implemented.

In analyzing the reasonableness of the 10% estimate, this researcher used the Survey of Contracting Statistics (NAVSUP PUB 561) for fiscal years 1988/1989. An average of 852,303 procurement actions were awarded by activities which are expected to participate in a fully implemented RYG Program. This average includes procurements for which no data are collected in CES and therefore are not subject to the RYG Program. These categories include subsistence, medical, nuclear weapons material and supplies, and all major weapon systems procurements. These excluded areas would make up 50% of the total procurement actions. The remaining 40% eliminated in the estimate could possibly be attributed to sole source procurements, waivers from participation, and continuing service contracts. The resulting 10% of total procurement actions which apply to the RYG Program is very conservative. However, when one makes estimates of possible

cost avoidance, to error conservatively is better than predicting greater savings that cannot be realized.

The 10% estimate is also used in predicting the dollar value of the contract which will be competed under the RYG Program. In this case, the estimate is more acceptable because the procurement actions for major weapons systems, which are not a part of the RYG Program, account for the vast majority of the procurement dollar value. Again, however, the estimate is considered conservative and thus can be readily used to formulate reasonable estimates of cost avoidance.

In conclusion, for the purpose of these cost avoidance calculations, the 10% estimated figure is acceptable, and does not represent any attempt to mislead or exaggerate the cost savings potential of the RYG Program. However, if a small percentage of the excluded 90% of remaining contracts were applicable to the RYG Program, the cost savings could dramatically increase. Each percent change equates to a potential savings of $86 million.

3. The assumption that 14 percent of the activity's RYG actions would have resulted in a displacement.

An informal survey of the activities participating in the RYG test Program conducted by this researcher during the RYG final test status meeting revealed that this figure appears to be high. The 14% estimate was derived by dividing the actual

displacements by the number of contracts awarded to Red, Yellow, or Green offerors (55/383 = .142). The belief is that a number of the contractors with an insufficient data classification would not have been displaced, resulting in a higher number of awards to the low offeror. This fact would drastically reduce the $440 million cost avoidance figure, and as shown in APPENDIX J equates to approximately $8 million per percentage point difference from the 14% estimate. The effect of this fact could lower the estimated $440 million cost avoidance by $24 million with just a 3 percentage points differences in the calculation. This appears to be a shift from the conservative approach previously taken in the estimates of cost avoidance. To retain the conservative approach, the calculation of this percentage may be better expressed by dividing the 55 displacements by the total contracts awarded (including the insufficient data offerors) which would yield an estimated displacement factor of approximately 6% This would reduce the cost avoidance figure by $64 million dollars.

4. The assumption that half the potential RYG displacement awards resulted in a Product Quality Deficiency Report (PQDR) because the award was to the low offeror with a history of providing less than requisite quality products. The estimated average cost of processing a PQDR is $1,200.

This $1,200 cost is a reasonable estimate of the total cost which could be avoided for the processing of QDR's. The problem with this calculation stems mainly from the estimated displacement rate of 14%. As previously shown, the displacement rate may be as low as 6% which would result in a lower overall cost avoidance. However, the net effect of the 6% change to the displacement rate will result in less than a 1% change in the total realized cost avoidance of $440 million. This would reduce the cost avoidance figure by $4 million.

5. The assumption that without RYG, the activities would have to perform additional quality assurance actions to reduce the risk of receiving less than requisite quality products from red or yellow low offerors. The average cost of these actions is $1,370. per award, based on the results of RYG test displacements.

This assumption is based upon the concept that the contracting office will have to perform additional quality assurance actions on all contracts which would have been displaced by an offeror with a better quality performance history. The RYG Program eliminates the need for these additional quality assurance actions when a Green offeror displaces a Red or Yellow offeror, and significantly reduces the requirement when a Yellow offeror displaces a Red offeror.

As a result of the elimination of quality assurance actions through the use of the RYG Program, an estimated $16

million would be saved. This researcher believes that this figure is a good approximation of the cost avoidance savings. The $1,370 savings per action is based on an average of the cumulative total of quality actions accomplished during the RYG Program test.

6. The assumption that RYG displacement awards increase cost by an estimated five percent.

This assumption recognizes the fact that displacement will have an administrative cost (ie: personnel cost, travel cost etc.) to the contracting office, and to the Department of Defense agency accomplishing the actions required. This cost will be proportional to the estimated displacement action savings. The estimate of 5% of the displacement cost avoidance is in the opinion of the researcher a reasonable amount, given that this includes all costs which are required to perform the quality assurance actions. This administrative cost translates to $6 million.

7. The repair and/or replacement cost of a defective item is estimated to be seven times the cost of the item. [Ref. 3]

This assumption has the biggest impact on cost savings of all seven of the assumptions made by the RYG Program. The assumption not only accepts assumption number 3, that the RYG Program has a 14% displacement rate, but also assumes that

half of the displaced awards will result in defective material requiring repair or replacement. In view of the use of these accepted assumptions, which this research has evaluated to be somewhat high, the $422 million contribution to the estimated $440 million in cost avoidance savings is suspect. This researcher believes that a more conservative estimate based on the 6% displacement factor provided in the evaluation of assumption 3, would equate to approximately $340 million in cost avoidance savings instead of $422 million.

In conclusion, the $440 million estimate may be the potential cost avoidance of the RYG Program; however, the sensitivity analysis presented shows that the assumptions in the calculation are extremely dubious. As a result, the $440 million estimate is probably too high and could be as low as approximately $352 million. However, the RYG Program's potential intrinsic value due to improved contractor quality may result in an even greater level of future cost avoidance.

During an interview with Mr. W. Mackinson, Assistant Deputy Commander of Contracting Management, at the Naval Supply Systems Command (NAVSUP), the estimated $440 million cost savings depicted above was discussed in depth. The conclusion was that the evaluation presented by this researcher, that the $440 million was somewhat unrealistic, was exactly the same as his. Furthermore, reliance upon

figures generated primarily by statistics which are based on the seven assumptions previously discussed are suspect at best.

3. Red/Yellow/Green Program Test Period Cost Avoidance

During the RYG Program Test period, a simplified formula for determining the savings attributable to cost avoidance was devised by NMQAO. Its purpose was to quantify the actual cost of not having to take additional quality assurance actions. These actions are normally taken to reduce the risk of receiving defective material or services from Red or Yellow contractors. The outcome was equally convincing that this program of assessing past contractor quality history was a noteworthy program. The basic formula used during the RYG Program test period was calculated by taking the displaced offeror's price plus any TEAs less the awardee's price plus any TEAs. The resulting difference was then classified as cost avoidance savings. The test period, up through February 1991, produced the following total cost avoidance:

If awarded to low offeror (with TEA)	$7,913,743.
Actual awards	$7,799,917.
Cost avoidance savings	$113,826.

A complete summary of the test period is exhibited in APPENDIX K.

Under the RYG Program, the required quality assurance action test period displacements cost avoidance has been determined to be approximately $1,370 per award. By taking the number of awards in 1989 from all major contracting activities (except NRCC Naples), 806,312 (APPENDIX J) and multiplying that number by the researcher's estimated overall displacement rate of 6%, 40,000 awards could be displaced if the RYG Program was in effect throughout the Navy. The cost avoidance for these displacements would exceed six million dollars. This translates into a large amount of contract administration oversight which could be eliminated and used in other areas.

D. EVALUATION OF RYG BENEFITS AND CONTRACT AWARDS

The five test sites using the RYG Program awarded 1,014 RYG Simplified Small Purchases and Major Purchases with TEA competitive procurements and 62 sole source contracts totaling approximately eight million dollars during the test period. The following table is a distribution of these procurements: [Ref. 4]

NADEP/NSC Pensacola	409
NSY/NSC Charleston	83
SPCC Mechanicsburg	154
NAC Indianapolis	330

NAEC Lakehurst	100
Total	1,076

Of the 1,014 competitive awards, nearly two-thirds were classified as "Insufficient Data" awards which leaves 383 competitive awards where the RYG Program had sufficient data in the PDREP/CES data base. These 383 competitive contracts and purchase orders awarded under the RYG Program, provided for 121 cases in which the low offerors had a less than satisfactory classification of past quality history. And of these 121 offerors, fifty-five were displaced. The term displaced means that the award was made to an offeror (other than the low offeror) due to the poor past quality history of the low offeror. The results of these figures provide the RYG Program and the PDREP/CES data base with a displacement rate of 14% (55/383 = .14). This is the figure used in the previously discussed assumption #3.

Additionally, 68% of the total competitive awards made under the RYG Program were made to the low offeror with a Green classification. Of the remaining 32% of the awards, the RYG Program was able to, through the use of the evaluation criteria of the program, determine the need for all additional quality assurance actions to be taken by the Contracting Officer in order to provide a proper quality material item to the customer. It is the researcher's opinion that the RYG

Program and the evaluation criteria provided a sound model for source selection.

Furthermore, the use of contract awards based on awardee's color classification requires the need for a mature and larger data base to generate a more accurate displacement rate. During the test period, 121 awards (32% of 383) made to other than the low offeror, 66 awards were made to the lowest offeror of either a Red or Yellow classification. In all these cases, the cost of the additional quality assurance actions required did not displace these offerors from receiving the award. However, 55 awards or 45% of the total awards (121) were displaced. This high displacement percentage quickly diminishes if the awards classified as "Insufficient Data" awards are added back to the calculation. In evaluating this relationship, a positive correlation can be achieved between the RYG Program displacement rate and the amount of quality history in the PDREP/CES data base. The resulting analysis of this researcher is that displacement rate of 14% may be artificially high due to the lack of data on file. The high percentage of displacements will diminish as the program continues.

Another example which exemplifies the quality driving emphasis of the RYG Program is the fact that of the 55 displaced awards, 26 went to contractors with Green

classifications for the commodity of interest and seven went to Yellow classified commodity holders. The remaining displaced awards went to "insufficient data" classified contractors. The researcher believes that this fact will induce many contractors to be more aware of their product quality status in the future.

The benefits derived from the RYG Program can be measured in not only the expected savings derived from cost avoidance but more importantly from the potential increase in customer satisfaction, improved contractor workmanship, and better material quality.

1. Customer Satisfaction.

The end-user who receives a quality part or service is less stressed by the factors of "the system's inadequacies". The RYG Program should not be looked at solely in terms of the dollars saved or costs avoided due to the reduced requirements for corrective quality assurance actions but rather in terms of increased user satisfaction due to reduced rework, replacement, and "down time" costs. This improved satisfaction of fleet personnel is the true measure of success for the RYG Program or any other similar type of program.

2. Contractor Workmanship.

The RYG Program can be expected to enhance the workmanship and material quality of contractors. Contractors

will feel the competitive need to produce better quality products as this program develops and the austere budget picture continues.

The final and ultimate testament of success and benefit resulting from the RYG Program will occur if this program becomes the genesis for the introduction of the Total Quality Management (TQM) concept within Government contractors. The concept revolves around the fact that product quality will become a measurement of a contractor, which results from an increase in pride and workmanship. The result could then easily blossom into the total quality program that Dr. Deming has so eloquently described in the theory of TQM.

3. Material Quality.

The key benefit of the RYG Program, however, is the reduction of down time costs by furnishing quality material to the fleet. The estimated $440 million in cost avoidance savings is largely attributable to the $422 million in savings from the reduction in repair/replacement costs, which in turn constitute the down time cost. If the RYG Program can only accomplish a mere 50% of that estimate, the cost savings will amount to $210 million. This equates to the approximate operating budget of the entire submarine force in fiscal year 1990. Additionally, the morale of the repair personnel will improve because of the reduced need for rework and repair.

In this researcher's opinion, the future benefits of this program are unlimited. If we are to survive the fiscal constraints of the future, material quality must be our primary concern.

E. SUMMARY

This chapter analyzed the results of the Navy's RYG Program Test. It depicted the savings due to cost avoidance and the benefits of the program. It also provided a case for the importance of having an accurate and correct CES/PDREP data base from which to draw past quality history information. The final chapter will present the conclusions and recommendations of the thesis.

V. CONCLUSIONS AND RECOMMENDATIONS

A. ANSWERS TO RESEARCH QUESTIONS

1. During the initial test period, did the RYG Program provide for improved product quality and/or cost avoidance?

In assessing the results of the RYG Program Test period, the amount of potential cost avoidance savings in the future was estimated at $440 million. In evaluating and analyzing this estimated cost saving provided by ASN(RDA)RM&QA this researcher determined that the estimate was somewhat inflated and optimistic. The potential cost avoidance savings from the full implementation of the RYG Program is, in the opinion of this researcher, approximately $300 million. This value is based on a more conservative estimate of the assumptions made by ASN(RDA)RM&QA. Additionally, the RYG Program Test period produced a cost savings of $113,000 resulting from taking the displaced offeror's price plus TEAs less the awardee's price plus TEAs. Although the $113,000 cost avoidance saving is substantially less than the estimated $440 million or $300 million, the fact remains that this figure is a significant amount of cost avoidance savings obtained during the test period.

Improvement in product quality, although a more illusive measurement of success, can also be extrapolated from the test period. The test period provided for a high percentage of contract awards to contractors with reliable performance history. This in turn improved the quality of material received by the Government. The RYG Program Test period also encouraged some contractors with poor contractor history to improve their performance in order to receive Government contracts. And finally, the RYG Program methodology successfully withstood the test of contractor protest.

2. What are the procedures used for testing the categories in the RYG Program?

The RYG Program Test period was sub-divided into three categories for evaluation. These categories were:

a. Small Purchase

b. Large Purchase

c. Fixed Price/Greatest Value

The procedures were discussed in detail in Chapter III and APPENDIX E, F, G, and H. These procedures were packaged and simplified for use in small purchase procedures. The large purchase procedures were more accommodating to the local factors such as labor rates and provided more flexibility to contracting activities. In both cases, however, Technical

Evaluation Adjustments (TEAs) were the means for adjusting for poor contractor past quality performance. The Fixed Price-Greatest Value procedure, though tested, did not provide any noteworthy results as did the previous two procedures.

3. Of the contracts awarded during the test period, what were the benefits of the RYG Program?

In evaluating the RYG Program Test period, the benefits received were:

a. the cost avoidance savings of $113,000.

b. the development of the CES data base.

c. the consistency of the RYG Program goals with the goals of the DoD TQM initiative.

d. the improved quality of material.

e. the improved customer satisfaction and potential for future quality improvements associated with the RYG Program.

B. CONCLUSIONS

1. The Red/Yellow/Green (RYG) Test Program served as an effective method of assessing the applicability of the program for possible future implementation.

The RYG Test Program proved that it could be a reliable tool for use in Navywide contracting activities. The program's effective use of quality performance history in

evaluating and classifying contractors as part of the source selection procedures was successful. The test procedures for small purchases were simple to execute and easy to apply. The major procurement procedures, however, required more subjective processing by the contracting activities which, in turn, made the procedure more time consuming. This conclusion was further supported by several people interviewed during the RYG Program Test final meeting in Washington DC, on March 6-8, 1991. [Ref. 7]

2. The RYG Program, although still in its infancy, is ready for Navywide implementation.

Although participants in the RYG Program Test final meeting stated that the program is still in its infancy, they strongly recommended the implementation of this new procedure Navywide. Of all the people at the RYG Program Test final meeting, the quality assurance personnel were the most supportive of the program. The contracting personnel were more reserved in their evaluation comments due to the initial increase in work load, but both communities were pleased with the RYG Program. The quality assurance personnel seemed to be more convinced than the contracting personnel that the program would reap benefits such as reduced rework and replacement costs. This would far outweigh any extra work or time required during the initial start up process.

3. The award processing time and/or work load increase as a result of implementing the RYG Program was negligible.

Contracting personnel's two concerns were the impact that the RYG Program had on award processing time and work load. These concerns were a normal reaction resulting from the introduction of a new program or task. During this research, none of the test sites could provide any evidence of a significant increase in work load and/or processing time.

4. Although the accuracy of the CES/PDREP data base was of initial concern to Contracting Officers, it was exceptionally high.

The accuracy of the data base that the test period evaluated was a potential problem. The concern was repeatedly made in both written memorandums and at the RYG Program Test final meeting of 6-8 March 1991. The conclusion, however, was that the 99% accuracy of these data in the CES/PDREP data base was sustainable. Furthermore, the process employed by NMQAO to notify the Red and Yellow contractors of their color classification, following the multiple step review procedure, provided a very reliable means of minimizing the introduction of erroneous information into the data base.

5. The RYG Program Test period produced some significant cost avoidance savings to the Government.

The RYG Program Test period produced some significant cost savings to the Government. The measure of this cost savings fluctuates in part due to the nature of the process being evaluated.

The RYG Program provides savings to the Government in several ways. First, it provides visible dollars savings to the customers by displacing in some instances poor contractors with better quality contractors. Second, the program aids the repair personnel by reducing the rework and replacement requirements through the purchase of higher quality items. Finally, it provides the contractor with a measurement of contractor quality which results in increased product quality.

C. RECOMMENDATIONS

1. The Navy should expand the RYG Program to all contracting activities.

The RYG Program's ability to reduce equipment down time, increase quality, and improving customer satisfaction, while withstanding all protests initiated to date, should be evaluated as a measurement of success. The implementation of the RYG Program should phase sites in gradually. Each site

should be evaluated on the basis of the amount of quality assurance history data it has in the CES/PDREP data base. NMQAO should be consulted on the selection of each site and a site analysis should be conducted prior to induction.

2. The RYG Program should be used with small purchase procedures.

The RYG Program is well suited for use by small purchase activities in source selection, contractor evaluation and classification due to the simple application of TEAs for small purchase procedures. The small purchase procedures of the RYG Program provide field activities with a contractor quality history data base, a proven evaluation method that accounts for poor contractor quality performance, and pre-packaged value for TEAs application. Furthermore, since the CES/PDREP data base is listed by both FSCs and contractor color classification, the contractor personnel can easily determine the contractor's color and apply the predetermined TEA to that proposal.

3. The Fixed Price/Greatest Value purchase procedures should not be used under the RYG Program.

The Fixed Price/Greatest Value procedures do not adapt well to the RYG Program. The Fixed Price/Greatest Value program applies percentages to price and technical design instead of TEAs based on contractor past quality performance.

A separate program should be further evaluated and developed using the Fixed Price/Greatest Value methodology which could accommodate the complexity of this procurement program. The application of the RYG Program should be applied on the individual commodity classifications, which can be used for simple small purchase procedures.

4. The CES/PDREP data base's high degree of accuracy needs to be maintained.

The task of maintaining a high quality data base is not only that of activities such as NMQAO, but of every fleet and supporting shore command in the Navy who submits quality information. The Navy needs to be reminded that the CES/PDREP data base accuracy is our responsibility. The validity of the RYG Program rests on the accuracy of the CES/PDREP data base. If error-free data are provided by all activities prior to being entered into the data base, a continued high quality data base will flourish.

D. AREAS FOR FURTHER RESEARCH

1. One area of further research is to evaluate and analyze the possibility of integration of the RYG Program with the existing automated procurement systems (such as APADE) which presently exist throughout the Navy and DoD.

2. Another area of research would be the development of a program or system that could integrate the Defense Logistics Agency (DLA) equivalent to CES/PDREP data base with the Navy's CES/PDREP data base program. This would allow for more contractor past quality performance information to be analyzed and developed into a product with an even broader base for contractor classification.

APPENDIX A: RED/YELLOW/GREEN EVALUATION CRITERIA

CODES AND DESCRIPTIONS

COLOR	CODE	EVALUATION CRITERION
RED	A	ON CURRENT NAVY VDAR
	B	METHOD C, D, AND/OR E CURRENTLY IN EFFECT
	C	QUALITY INFORMATION ON LATEST PRE-AWARD SURVEY (PAS) WITHIN LAST YEAR - NO AWARD
	D	LATEST PRODUCT-ORIENTED SURVEY (POS) IN LAST YEAR UNACCEPTABLE
	E	LATEST QUALITY SYSTEM REVIEW (QSR) IN LAST YEAR UNACCEPTABLE
	F	LATEST SPECIAL SURVEY IN LAST YEAR UNACCEPTABLE
	G	REJECT RATE 15% OR MORE IN LAST YEAR FOR 2 OR MORE LOTS
	H	LATEST TWO FIRST ARTICLE TESTS (FAT) IN LAST YEAR UNSATISFACTORY
	J	2 OR MORE CATEGORY "I" QDRS IN THE LAST YEAR
	K	6 OR MORE CATEGORY "II" ACTION QDRS IN THE LAST YEAR
	N	ON DLA CONTRACTOR ALERT LIST FOR MAJOR DEFICIENCIES

RED/YELLOW/GREEN EVALUATION CRITERIA

CODES AND DESCRIPTIONS

YELLOW	A	ISSUED VDAR LETTER OF CONCERN
	B	PREVIOUSLY CLASSIFIED "RED" - NOT WITHIN RED EVALUATION RANGE
	C	LATEST QUALITY PAS WITHIN LAST YEAR - AWARD WITH FINDINGS
	D	LATEST POS IN LAST YEAR ACCEPTABLE WITH CORRECTIONS
	E	LATEST QSR IN LAST YEAR ACCEPTABLE WITH CORRECTIONS
	F	LATEST SPECIAL SURVEY IN LAST YEAR ACCEPTABLE WITH CORRECTIONS
	G	REJECT RATE 6-14% FOR 2 OR MORE REJECTED LOTS IN LAST YEAR
	H	LATEST FAT IN LAST YEAR UNSATISFACTORY
	J	ONE CATEGORY "I" QDR IN LAST YEAR
	K	3-5 CATEGORY "II" ACTION QDRS IN LAST YEAR
	N	ON DLA CONTRACTOR ALERT LIST FOR MINOR DEFICIENCIES
	P	PREVIOUSLY RED - NO REJECTS FOR 5 OR MORE LOTS IN LAST 6 MONTHS

RED/YELLOW/GREEN EVALUATION CRITERIA

CODES AND DESCRIPTIONS

GREEN	C	LATEST PAS IN LAST YEAR - AWARD WITH NO FINDINGS
	D	LATEST POS IN LAST YEAR ACCEPTABLE
	E	LATEST QSR IN LAST YEAR ACCEPTABLE
	F	LATEST SPECIAL SURVEY IN LAST YEAR ACCEPTABLE
	G	REJECT RATE LESS THAN 6% FOR 5 OR MORE LOTS IN LAST YEAR
	H	ALL FAT IN LAST YEAR SATISFACTORY
	K	0-2 CATEGORY "II" ACTION QDRS IN LAST YEAR AND G APPLIES
	P	PREVIOUSLY YELLOW - NO REJECTS FOR 5 OR MORE LOTS IN LAST 6 MONTHS

APPENDIX B: GUIDELINE FOR TEA ASSIGNMENT

RED CLASSIFICATION

CODE	ADDITIONAL QA REQUIREMENTS
A	1a or 1b, 2a or 2b, 3, 4, 5 or 6, 7
B	1a or 1b, 2a or 2b, 4, 5 or 6, 7
C	1a or 1b, 4, 5 or 6, 7
D	1a or 1b, 4, 5 or 6, 7
E	1a or 1b, 2a or 2b, 4, 5 or 6, 7
F	1a or 1b, 4, 5 or 6, 7
G	1a or 1b, 3, 4, 5 or 6, 7
H	1a or 1b, 2a or 2b, 4, 5 or 6, 7
J	1a or 1b, 2a or 2b, 3, 4, 5 or 6, 7
K	1a or 1b, 3, 4, 5 or 6, 7
N	1a or 1b, 2a or 2b, 3, 4, 5 or 6, 7

YELLOW CLASSIFICATION

A	1a or 1b, 3, 4, 5 or 6, 7
B	1a or 1b, 3, 4, 5 or 6, 7
C	1a or 1b, 4, 5 or 6
D	4, 5 or 6
E	4, 5 or 6
F	4, 5 or 6

APPENDIX B

GUIDELINE OF TEA ASSIGNMENT

CODE	ADDITIONAL QA REQUIREMENTS
G	4, 5 or 6, 7
H	2a, 4, 5 or 6, 7
J	4, 5 or 6, 7
K	4, 5 or 6, 7
N	2a, 4, 5 or 6
P	1a or 1b, 4, 5 or 6, 7

NOTE: The additional quality assurance actions depicted in this appendix are the RYG Program requirements. The abbreviations listed (ie: 1a or 2a) correspond to the quality assurance actions provided in APPENDIX D.

APPENDIX C: SMALL PURCHASE

TECHNICAL EVALUATION ADJUSTMENTS

RED CLASSIFICATION

Government Source Inspection[10]	$500*
Receipt Inspection as Destination (Navy Rep)[15]	$1,194
Quality Assurance Letter of Instruction[17]	$755
	$2,449

YELLOW CLASSIFICATION

Government Source Inspection[10]	$500*
Quality Assurance Letter of Instruction[17]	$755
	$1,255

* Actual DCMC costs

APPENDIX D: MAJOR PURCHASE

TECHNICAL EVALUATION ADJUSTMENTS

Quality Assurance Actions	Estimated Cost
1. Pre-Award Survey	
a. DCMC	$500*
b. PCO Representative Participation	
(1) Local[1]	$775
(2) Intermediate[2]	$1,380
(3) Distant[3]	$2,095
2. Post-Award Orientation	
a. DCMC	$550*
b. PCO Representative Participation	
(1) Local[4]	$1,075
(2) Intermediate[5]	$2,110
(3) Distant[6]	$3,590
3. Product Oriented Survey (PCO Representative / DCMC)	
a. Local[7]	$800**
b. Intermediate[8]	$1,500**
c. Distant[9]	$2,215**
4. Government Source Inspection[10]	$500*
5. Receipt Inspection at Source (Navy and DCMC)	
a. Local[11]	$650***
b. Intermediate[12]	$1,360***

c.	Distant[13]	$2,182***
6.	Receipt Inspection at Destination (Navy)	
a.	Low[14]	$597
b.	Medium[15]	$1,194
c.	High[16]	$2,332
7.	Quality Assurance Letter of Instruction[17]	$755***

Notes: (1) Except for actual DCMC costs, as noted, the above costs are samples. Actual costs may vary between activities, based on each activity's stabilized manhour rate.

* actual DCMC cost

** includes actual DCMC cost - $400

*** includes actual DCMC cost - $275

APPENDIX E: TECHNICAL EVALUATION ADJUSTMENT

CALCULATIONS

[1]Calculated $30/hr x 8 hrs = $240 + $35 mileage = $275 + $500.

[2]Calculated $30/hr x 8 hrs = $240 + $240 (8 hrs travel @ $30/hr)+ $200 (2 days per diem @ $100/day) + $200 travel costs = $880 + $500.

[3]Calculated $30/hr x 8 hrs = $240 + $480 (16 hrs travel @ $30/hr) + $300 (3 days per diem @ $100/day) + $575 travel costs = $1,595 + $500.

[4]Calculated $30/hr x 16 hrs = $480 + $45 mileage = $525 + $550.

[5]Calculated $30/hr x 16 hrs = $480 + $480 (16 hrs travel @ $30/hr) + $400 (4 days per diem @ $100/day) + $300 travel costs = $1,660 + $550.

[6]Calculated $30/hr x 16 hrs = $480 + $960 (32 hrs travel @ $30/hr) + $600 (6 days per diem @ $100/day) + $1,000 travel costs = $3,040 + $550.

[7]Calculated $30/hr x 12 hrs = $360 + $40 mileage = $400 + $400 (DCAS costs).

[8]Calculated $30/hr x 12 hrs = $360 + $240 (8 hrs travel @ $30/hr) + $300 (3 days per diem @ $100/day) + $200 travel costs = $1,100 + $400 (DCAS costs).

[9]Calculated $30/hr x 12 hrs = $360 + $480 (16 hrs travel @ $30/hr) + $400 (4 days per diem @ $100/day) + $575 travel costs = $1,815 + $400 (DCAS costs).

[10]Calculated $34.18/hr x 14 hrs.

[11]Calculated $43/hr x 8 hrs = $344 + $31 mileage = $365 + $265 (DCAS costs).

[12]Calculated $43/hr x 8 hrs = $344 + $344 (8 hrs travel @ $43/hr) + $200 (2 days per diem @ $100/day) + $200 travel costs = $1,088 + $275 (DCAS costs).

[13]Calculated $43/hr x 8 hrs = $344 + $688 (16 hrs travel @ $43/hr) + $300 (3 days per diem @ $100/day) + $575 travel costs = $1,907 + $275 (DCAS costs).

[14]Calculated $43/hr x 4 hrs = $172 + $100 material handling + $325 test costs.

[15]Calculated $43/hr x 8 hrs = $344 + $200 material handling + $650 test costs.

[16]Calculated $43/hr x 24 hrs = $1,032 + $500 material handling + $800 test costs.

[17]Calculated DCAS @ $34.18/hr x 8 hrs = $275 + $480 (procurement representative @ $30/hr x 16 hrs).

APPENDIX F: CLAUSES FOR SMALL PURCHASE PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES), "Red/Yellow/Green" (RYG) program. The test is authorized by the Assistant Sectary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractor's past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES. The price to be considered in determining best value will be the evaluated price after Technical Evaluation Adjustments (TEA)s for related quality assurance actions, as applicable, are applied to the offered price.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTOR--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (SIMPLIFIED SMALL PURCHASE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (RYG) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of RYG is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factor considered. The test program uses accumulated contractor quality performance on selected commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data", based on the degree of risk to the Government of receiving poor quality products. Such classifications are then used to apply Technical Evaluation Adjustments (TEA)s during source selection.

(c) A TEA is a monetary assessment added to the price of selected commodities that have been classified as either "Red", or "Yellow" for specific contractors, and is based on the cost to the Government for effecting additional quality considerations that would otherwise not be required if award were made to a contractor with a satisfactory performance history. For purposes of requirements using the simplified small purchase procedures, standardized TEAs have been established for the "Red" and the"Yellow" classifications. During evaluation of quotations, the applicable TEA is added to the quoted price of the "Red" and/or "Yellow" commodity, and after consideration of any other pertinent price-related factors (e.g., transportation charges, First Article Testing, discount terms, etc.), becomes the basis for determining award of the purchase order. A commodity's classification may change over time as new or revised quality performance data become available.

(d) Classifications for the test program are summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history.

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions needed; Technical Evaluation Adjustments (TEA) applied to offered price.

"Red"--High risk. Special alert to history of poor quality performance; TEA applied to offered price(s), and contract award requires higher level approval.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, a TEA is not assessed.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Naval Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX G: CLAUSES FOR MAJOR PURCHASE PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES), "Red/Yellow/Green" (RYG) program. The test is authorized by the Assistant Sectary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractor's past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES. The price to be considered in determining best value will be the evaluated price after Technical Evaluation Adjustments (TEA)s for related quality assurance actions, as applicable, are applied to the offered price.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTOR--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (MAJOR PURCHASE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (RYG) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of RYG is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factor considered. The test program uses accumulated contractor quality performance on selected commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data", based on the degree of risk to the Government of receiving poor quality products. Such classifications are then used to apply Technical Evaluation Adjustments (TEA)s during source selection.

(c) A TEA is a monetary assessment added to the price of selected commodities that have been classified as either "Red", or 'Yellow" for specific contractors, and is based on the cost to the Government for effecting additional quality considerations that would otherwise not be required if award were made to a contractor with a satisfactory performance history. During evaluation of quotations, the necessity for any additional quality assurance requirements will be determined, and the applicable TEA will be assessed onto the quoted price of the "Red" and/or "Yellow" commodity. After consideration of any other pertinent price-related factors (e.g., transportation charges, First Article Testing, discount terms, etc.), this adjusted price becomes the basis for determining award of the purchase order. A commodity's classification may change over time as new or revised quality performance data become available.

(d) Classifications for the test program are summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history.

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions needed; Technical Evaluation Adjustments (TEA) applied to offered price.

"Red"--High risk. Special alert to history of poor quality performance; TEA applied to offered price(s), and contract award requires higher level approval.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, a TEA is not assessed.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Naval Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX H: CLAUSES FOR FIXED PRICE/GREATEST VALUE

PROCEDURES

NOTICE TO PROSPECTIVE OFFERORS (NOV 1988)

(a) This procurement is subject to a test of the Navy's Contractor Evaluation System (CES), "Red/Yellow/Green" (RYG) program. The test is authorized by the Assistant Sectary of the Navy (Shipbuilding and Logistics) for the acquisition of specific commodities within designated Federal Supply Classes (FSCs) by participating test activities.

(b) The Government reserves the right to award to the contractor whose offer represents the best overall purchase value to the Government. As such, the basis for contract award will include an evaluation of proposed contractor's past quality performance history on the particular commodity or commodities, identified below, as recorded in the CES.

(c) The procedures described in the clause of this solicitation entitled "ADDITIONAL EVALUATION FACTOR--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988)" will be used by the contracting officer to assist in determining the best purchase value for the Government--price, past quality performance, and other factors considered.

(d) The commodities included in this test, as currently solicited, are:

FSC No.	FSC Nomenclature	CLIN

ADDITIONAL EVALUATION FACTORS--TEST OF CONTRACTOR EVALUATION SYSTEM (NOV 1988) (FIXED PRICE--GREATEST VALUE PROCEDURES)

(a) This procurement is part of a test of the Navy's Contractor Evaluation System (CES) "Red/Yellow/Green" (RYG) Program, authorized by the Assistant Secretary of the Navy (Shipbuilding and Logistics), for the acquisition of specific commodities by participating activities. At the end of the test, data concerning awards made during the period will be evaluated to assess the program's effectiveness and impact on the acquisition process.

(b) The purpose of RYG is to assist contracting personnel during source selection to determine the best value for the Government--price, past quality performance, and other factor considered. The test program uses accumulated contractor quality performance on selected commodities as either "Red" (high risk), "Yellow" (moderate risk), "Green" (low risk), or "Insufficient Data", based on the degree of risk to the Government of receiving poor quality products. A commodity's classification may change over time as new or revised quality performance data become available.

(c) For the purpose of source evaluation and selection, both the color classification of an offeror's commodity and the proposed price(s) shall be evaluated in accordance with weighted evaluation criteria established by the Government prior to the receipt of proposals. Price-related factors, such as transportation charges, First Article Testing, discount terms, etc., will also be considered; however, no score or rating shall be applied.

(d) Offerors are advised that, although price is of significance in determining the successful offeror, past quality performance on the proposed commodity (as classified with the RYG data base) is essentially more important, and shall be evaluated accordingly. Each of the RYG classifications and its relative order of importance is summarized as follows:

"Green"--Low risk. No extraordinary quality requirements or additional actions required; satisfactory quality history. Commodities within this classification are apportioned a greater weight or value in the evaluation than those classified as either "Yellow" or "Red".

"Yellow"--Moderate risk. History of quality problems; special quality requirements/actions needed. Due to the additional quality assurance considerations that may be necessary, commodities within this classification are weighted less than those classified as "Green", but are of greater value than those within the "Red" category.

"Red"--High risk. Special alert to history of poor quality performance; contract award requires higher level approval. These commodities are apportioned the least available weight or value for past quality performance relative to commodities within the "Green" or "Yellow" classifications.

"Insufficient Data"--Generally, may be commodities of first-time offerors or offerors for whom current, up-to-date quality performance history is unavailable; additional quality actions may be needed and invoked; however, commodities within this classification shall be evaluated solely on the basis of price and related factors. Past quality performance will not be a consideration in the evaluation of commodities for which current quality performance data is not set forth within the data base.

(e) Prospective offerors may address questions with regard to their assessment classification on particular commodities to: Naval Sea System Command Detachment, Naval Material Quality Assessment Office (NMQAO), Federal Building, Room 423, 80 Daniel Street, Portsmouth, NH 03801-3884, (Telephone) 608-431-9460.

APPENDIX I: FIXED PRICE - GREATEST VALUE SAMPLE EVALUATION PROCEDURES

Source Selection/Evaluation Method

(The following example is illustrative of a source selection/evaluation method incorporated by RYG test procedures)

Total Points (MAX)	=	100 points (%)
Total Technical	=	60 points (%)
Total Price	=	40 points (%)

CES Classification	Technical Score
Green	60 points
Yellow	35 points
Red	10 points
Insufficient Data	60 points

Price Score

Within 0 percent - 5 percent of low offeror:	GREEN
Within 5+ percent - 15 percent of low offeror:	YELLOW
Within 15 percent of low offeror:	RED

Green	40 points
Yellow	26 points
Red	13 points

POSSIBLE OUTCOMES

	COLOR		SCORE		
RANKING	TECH	PRICE	TECH	PRICE	TOTAL SCORE
1	G	G	60	40	100
2	G	Y	60	26	86
3	Y	G	35	40	75
4	G	R	60	13	73
5	Y	Y	35	26	61
6	R	G	10	40	50
7	Y	R	35	13	48
8	R	Y	10	26	36
9	R	R	10	13	23

APPENDIX J: RYG COST AVOIDANCE CALCULATIONS

Procurement Actions Fiscal Years 1988/1989 (From Survey of Contracting Statistics, NAVSUP Publication 561)

	1988		1989	
	Actions	$(000s)	Actions	$(000s)
ICPs	107,437	2,864,250	89,896	2,738,333
NRCCs(less Naples)	32,170	1,717,039	25,159	1,462,077
NSCs	420,568	1,122,162	355,977	1,063,283
NAVAL LABS	148,128	1,678,260	153,543	1,944,414
Miscellaneous				
NAS CORPUS CHRISTIE	5,196	4,866	5,114	6,207
NAC INDIANAPOLIS	22,945	494,852	18,769	326,717
MCAS CHERRY PT.	19,634	25,213	15,288	24,160
NAS LAKEHURST	10,107	71,276	10,687	115,976
NAS PAX RIVER	19,956	282,281	18,119	283,065
NAS POINT MUGU	11,752	35,536	16,931	49,410
NSY NORFOLK	23,623	68,032	9,810	32,459
NSY PORTSMOUTH	13,312	62,013	14,980	47,837
NSY MARE ISLAND	16,519	40,899	20,427	49,140
NSY PEARL HARBOR	2,623	3,781	8,367	15,564
NWC CRANE	19,700	138,408	18,640	146,500
NOS INDIAN HEAD	7,334	64,788	8,279	133,114
NOS LOUISVILLE	10,896	63,879	10,258	46,675
NOS BAY ST. LOUIS	6,393	11,638	6,068	13,305
TOTAL	898,293	8,749,173	806,312	8,498,236

Average for Activities during FY 88/89: 852,303 actions for $8,623,705,000.

RYG DATA USING FY 88/89 FIGURES

RYG Test Displacement Rate - 14%

Displacement during RYG test - 55

Competitive awards - low offeror is color classified -383

14% = 100 x (55/383)

Estimated RYG Actions: 85,230 for $862,370,500.

Average FY 88/89 actions for above sites: 852,303 for $8,623,705,000.

Estimated percentage subject to RYG - 10%

85,230 = 10% of 852,303

$862,370,500 = 10% of 8,623,705,000

Estimated RYG Displacement Actions: 11,932 for $120,731,870.

RYG Test Displacement Rate - 14%

Estimated RYG actions - 85,230 for $862,370,500.

11,932 = 14% of 85,230

$120,731,870 = 14% of 862,370,500.

Estimated Repair/Replacement Cost: $422,561,545.

NOTE: Since RYG is not now operational at the sample implementation sites, the estimated 11,932 RYG displacement actions above represent awards to red or yellow low offerors. If half of these awards results in defective material, the cost of repairing/replacing the defective material is estimated to be seven times the cost of the material.

Estimated operational RYG action dollars - $120,731,870.

$422,561,545. = 7 x (.5 x $120,731,870.)

Estimated Product Quality Deficiency Report (PQDR) Cost:

$7,159,200.

NOTE: Since RYG is not now operational at the sample implementation sites, the estimated 11,932 RYG displacement actions above represent awards to red or yellow low offerors. If half of these

awards results in defective material, Product Quality Deficiency Reports would be issued on each defective product.

Estimated RYG displacement actions - 11,932

PQDR average preparation/processing cost - $1,200.

$7,159,200 = $1,200 x (.5 x 11,932)

Estimated additional Quality Assurance Actions Cost:

$16,346,840.

Estimated RYG displacement Actions - 11,932

Additional QA actions estimated cost - $1,370/action

$16,346,840 = $1,370 x 11,932

APPENDIX K: RED/YELLOW/GREEN TEST STATUS REPORT

Prepared 28 FEB 1991

EXECUTIVE SUMMARY
RED/YELLOW/GREEN PROCUREMENTS

		RYG Number	Dollars ($)	Average PALT
Total RYG Procurements ...		1668		
	Waived	111		
	Awarded	1557	13,205,806	50
I.	a. Competitive	1453	12,068,501	51
	b. Sole Source	104	1,137,305	32
II.	a. $25,000 and under..	1515	7,323,381	48
	b. over $25,000	42	5,882,425	111

Cost Comparisons

(Competitive awards using TEAs. No Greatest Value/Best Buy Awards)

1. Award to low offeror - with no TEAs:

   If all RYG procurement awards were to low offerors with no TEAs. Cost($)..... 7,599,298.

2. Award to low offeror - with TEAs:

   If all RYG procurement awards were to low offeror with TEAs. Costs ($)..... 7,913,743.

3. Actual awards:

The actual RYG procurement awards with TEAs for RED or Yellow awardee's. Cost ($).... 7,799,917.

4. Cost Avoidance:

Cost avoidance is the low offerors price plus TEAs minus the awardee's price plus TEAs (if any). Cost ($)..... 113,826.

APPENDIX L: GLOSSARY OF ACRONYMS

APACE	Automation of Procurement and Accounting Data Entry
ASN	Office of the Assistant Secretary of the Navy
BIS	Buyer Information Service
BPA	Blanket Purchase Agreement
CAGE	Commercial And Government Entity
CBD	Commerce Business Daily
CEDES	Contractor Evaluation Data Entry System
CES	Contractor Evaluation System
CIP	Contractor Improvement Program Alert List
COC	Certificate of Competency
DCMC	Defense Contractor Management Command
DLA	Defense Logistics Agency
DLSIE	Defense Logistics Studies Information Exchange
DoD	Department of Defense
DON	Department of the Navy
FAT	First Article Testing
FAR	Federal Acquisition Regulation
FMSO	Fleet Material Support Office
FSC	Federal Supply Classification
GSA	General Services Administration
GSI	Government Source Inspection

HM&E	Hull, Mechanical, and Electrical
MIR	Material Inspection Record
MODEM	Modulator / Demodulator
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NMQAO	Navy Material Quality Assessment Office
PAS	Pre-award Survey
PCO	Procuring Contracting Officer
PDREP	Product Deficiency Report and Evaluation Program
PMRS	Procurement Management Reporting System
POS	Product-Oriented Survey
QA	Quality Assurance
QDR	Quality Deficiency Report
QSR	Quality System Review
ROD	Report of Discrepancy
SBA	Small Business Administration
SECNAV	Secretary of the Navy
SPCC	Navy Ships Parts Control Center
SS	Sub-Safe/Level 1
SSPO	Strategic Systems Project Office
TEA	Technical Evaluation Adjustment
VDAR	Navy Vendor Data Analysis Report

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